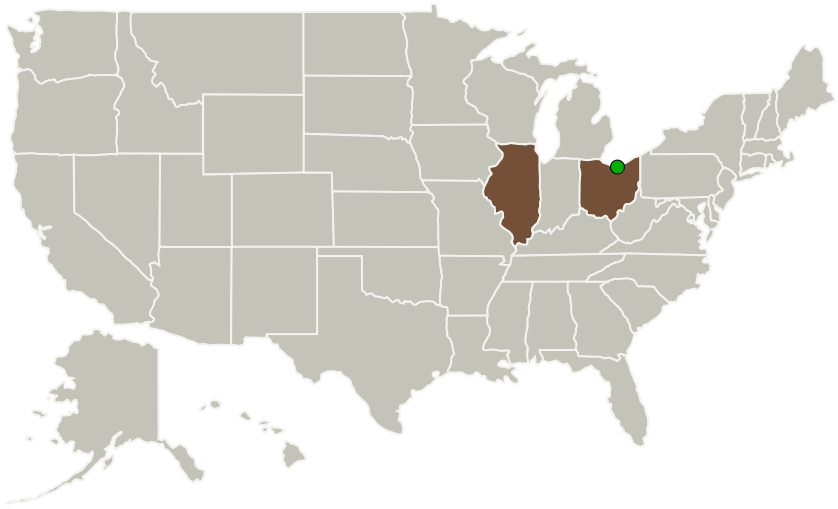
High-Volume Production of Lightweight, Multi-Junction Solar Cells Using 6-inch GaAs, Phase II

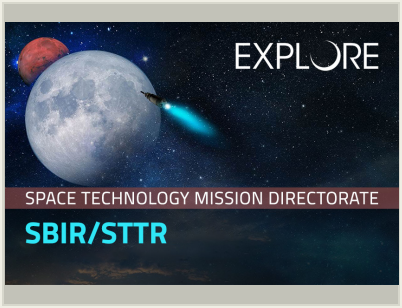
Completed Technology Project (2013 - 2016)

Project Introduction

In the proposed Phase II program, we will transition MicroLink's 6-inch epitaxial lift-off (ELO) solar cell fabrication process into a manufacturing platform capable of sustaining large-volume production. Key Phase II improvements in the ELO process are reduction in cycle time and increase in the yield of large-area devices. In addition, we will transition all critical device fabrication processes to 6-inch production tool sets that are designed for volume production, with an emphasis on automated cassette-to-cassette and batch processes that will minimize operator dependence and variability. During the Phase II program we will establish a pilot production line capable of at least 1500 6-inch wafers per month at greater than 80% yield. We will also increase the yield and manufacturability of the 6-inch reclaim process, which is crucial to reducing the cost of the cells. This will involve a closer collaboration with our substrate reclaim vendor and the establishment of clear metrics to qualify key process variables impacting device yield. A successful conclusion of this Phase II program will place us in strong position to support potential SEP volume solar cell manufacturing requirements.

Primary U.S. Work Locations and Key Partners





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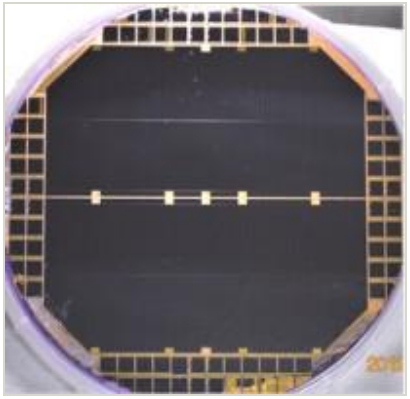
Organizations Performing Work	Role	Type	Location
MicroLink Devices, Inc.	Lead Organization	Industry Minority-Owned Business	Niles, Illinois
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Illinois	Ohio

Images



Briefing Chart
High-Volume Production of Lightweight, Multi-Junction Solar Cells Using 6-inch GaAs, Phase II *(https://techport.nasa.gov/image/129013)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
MicroLink Devices, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Christopher Youtsey

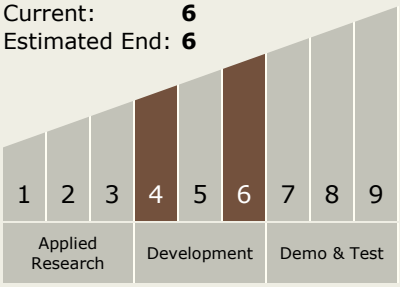
Co-Investigator:
Christopher Youtsey

High-Volume Production of Lightweight, Multi-Junction Solar Cells Using 6-inch GaAs, Phase II

Completed Technology Project (2013 - 2016)

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.1 Photovoltaic

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System